

REMARKS

Upon entry of this Amendment, claims 1-15 will remain in this application. Claim 16 was previously canceled. Reconsideration of the application is requested.

The drawings appended to this Amendment incorporate the changes proposed November 6, 2002, which changes have been approved by the Examiner.

Independent claims 1, 3, 4, 7, and 11-13 are again rejected as being unpatentable over the known carbon panel devices discussed on pages 2-3 of the substitute specification in view of U.S. Patent 4,467,836 to Ragout and U.S. Patent 4,895,185 to Champleboux et al. Claims 8 and 15 are rejected based on the same items and further in view of U.S. Patent 5,937,606 to Meier et al. Claim 14 is now rejected based on the known carbon panel devices referred to, the Ragout and Champleboux et al. patents, and newly applied U.S. Patent 4,966,802 to Hertzberg. Reconsideration of each of these rejections is requested.

Both the Ragout patent and the Champleboux et al. patent describe packers in which ends are pressed to a solid end material by segmental conical wedges. These wedges are located between layers of packer material. The matrix of each packer is flexible rubber. In regard to the structure of the layers, in the Champleboux et al. patent, reference is made to the "principle patent" of Ragout. It is made clear, from lines 39-

59 in column 2 of the Ragout patent, that the reinforcement is made out of steel fibers, with isotropic properties, which are oriented, in both plies, in a helical manner, enabling expansion when pressure is set to the packer.

According to the present invention, on one side, fibers are made of carbon. On the other side, a CRF-composite plate is used; thus, in the present invention, fibers are imbedded in a stiff matrix of high strength such that the fibers are bonded together by the epoxy matrix. This is important because forces are transferred from fiber to fiber by means of the rigid matrix. Real fibers very often do not reach from one end of the plate to the other. According to the present invention, plates are adhesively bonded along the sides of the plates, and forces are not transferred only at anchored ends of the structure.

A non-colinear orientation, i.e. an orientation at an angle to the plate direction, such as a helical orientation in a tube form, would be detrimental because the fibers would suffer from a force component vertical to the fiber directions. Because carbon fibers are anisotropic, they tend to break easily when vertical force is applied. Therefore, either the fibers would break or the shear forces would lead to cracking of the matrix, leading to at least partial destruction of the composite plate.

Because carbon fibers are easily damaged by applying forces which are not directed in fiber directions, splitting of a plate

having such fibers is very delicate. One of ordinary skill in the field of carbon panel devices would not apply methods known from patents, such as the Ragout and Champleboux et al. patents, relating to reinforcement using steel or cable plies.

It is again respectfully submitted that independent claims 1, 3, 4, 7, and 11-13 as they presently appear in this application are patentable. The remaining claims of this application are dependent claims and are patentable as well.

In the rejection of claim 14, the Examiner concludes that splitting carbon fiber reinforced composites would have been obvious, and uses the Hertzberg patent disclosure to support this. The Hertzberg patent describes the formation of fiber reinforced structures by adhesively joining different elements. These elements are formed by combining multiple layers. Nowhere except in lines 4 to 15 of column 3 is something similar to splitting mentioned in the Hertzberg document. In this portion, one edge of an elongate, relatively thick fiber reinforced resin composite plate is sliced to create two equal thickness segments. This seems to refer to thick plates being made out of previously impregnated ply elements such as these referred to in lines 12-18 of column 4. It is not even clear if slicing and splitting describe the same procedure. The part of the Hertzberg patent mentioned can not be considered to suggest splitting a carbon fiber reinforced plate as claimed in this

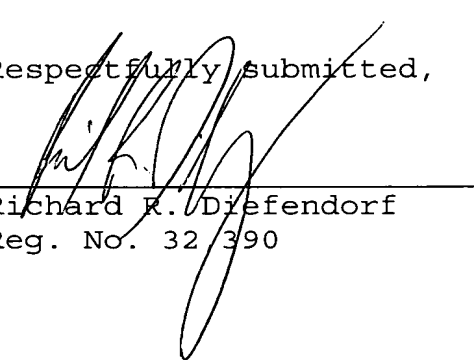
application. Nothing in the Hertzberg disclosure, moreover, explicitly states that carbon fibers are used as reinforcement fibers in the Hertzberg composites, and reliance on the Hertzberg patent in the manner set forth in section 6 on pages 3-4 of the Office Action is misplaced.

Lastly, with respect to the rejection of claims 8 and 15, the Meier et al. patent mentions, from line 62 in column 3 to line 9 in column 4, wedges as pressing means for lamina ends. Split plates are used according to the present invention. The Meier et al. patent also discloses bolts, which do not form pressing means.

It is respectfully submitted that, for reasons discussed above, this application is allowable in its present form. Should the Examiner have any questions after considering this Amendment, the Examiner is invited to telephone the undersigned attorney.

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